COMPARATIVE STUDY OF THE PERFORMANCE OF PUBLIC AND PRIVATE SCHOOLS, THE CASE OF MONGOLIA

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ABSTRACT

The studies concerning private versus public education have been critical in both advanced and emerging economies. Thus, this thesis tries to answer two questions regarding the performance of public and private schools, and the effects of school factors on school performance. Therefore, the thesis applies quantitative analysis methods, education production function, and employs data from the Ministry of Education of Mongolia and National Statistics Office of Mongolia. Based on the comparison analysis, private schools outperform public schools by some distance. Then, according to the estimation results, teacher qualification and library affect school performance positively. In contrast, school size, class size and student-teacher ratio have a negative effect on school performance. Besides, having sports hall does not affect student performance either positively or negatively.

Keywords: Public schools, Private schools, Secondary education, School performance, Education production function
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>BLUE</td>
<td>Best Linear Unbiased Estimator</td>
</tr>
<tr>
<td>EFA</td>
<td>Education for All</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
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<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GEE</td>
<td>General Entrance Exam</td>
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<td>HDI</td>
<td>Human Development Index</td>
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<td>MDG</td>
<td>Millennium Development Goals</td>
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<td>MEM</td>
<td>Ministry of Education of Mongolia</td>
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<td>NAEP</td>
<td>National Assessment of Educational Progress</td>
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<td>NCES</td>
<td>National Centre for Education Statistics</td>
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<td>NEA</td>
<td>National Education Association</td>
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<tr>
<td>NGO</td>
<td>Non-Government Organisations</td>
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<td>NPM</td>
<td>New Public Management</td>
</tr>
<tr>
<td>NPO</td>
<td>Non-Profit Organisations</td>
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<td>NSOM</td>
<td>National Statistics Office of Mongolia</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-Operation and Development</td>
</tr>
<tr>
<td>OLS</td>
<td>Ordinary Least Square</td>
</tr>
<tr>
<td>PISA</td>
<td>Programme for International Student Assessment</td>
</tr>
<tr>
<td>SIMSS</td>
<td>Second International Mathematics and Science Study</td>
</tr>
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<td>TIMSS</td>
<td>Third International Mathematics and Science Study</td>
</tr>
<tr>
<td>UNESCO</td>
<td>The United Nations Educational, Scientific and Cultural Organisation</td>
</tr>
<tr>
<td>VAT</td>
<td>Value Added Tax</td>
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<tr>
<td>VIF</td>
<td>Variance Inflation Index</td>
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<td>WEF</td>
<td>World Economic Forum</td>
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<tr>
<td>2SLS</td>
<td>Two-Steps Least Square</td>
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1. INTRODUCTION

The number of students who study at private schools increases year by year. According to Verger et al. (2017), this trend continues all over the world, except Sub-Saharan Africa. Thus, the research comparing public and private schools has been vital in both the developed and developing countries.

The types of schools alter depending on who owns, manages and finances education (OECD, 2012). In its simple form, we define public schools as those which are owned, operated and financed by the government. In contrast, private schools are those which owned, managed and funded by non-government sectors, business enterprises and other private institutions. However, schools need not be classified as fully public or entirely private. Therefore, schools could be a combination of both private and public sector.

Furthermore, current trends around the globe also reveal that various developed and developing countries are attempting the private and public partnership to share costs and decrease the budget deficit. Governments in these countries look for different mechanisms of education delivery and funding outside of the public sphere. These initiatives are supported by neo-liberal thinkers, and they believe that market mechanisms can correct inefficiency problems (Pedro, Leroux, & Watanabe, 2015).

In Mongolia, after the Soviet Union collapse, education system faced a great challenge. The country received aid from several international organisations and countries to reconstruct its education system. The legal framework of the new Constitution and Education Law initiated the education system reform. Therefore, private institutions started to provide education service in mid-1990's.

Nowadays, private schools and institutions grow year by year but there's still the ongoing debate concerning if private schools really perform better than public schools in Mongolia. That's why the study of private versus public schooling is a topic of great interest at present. Therefore, a genuinely comparative study on the performance of private and public education becomes vital to both education researchers and the policymakers. Moreover, in Mongolia, no notable study was conducted regarding the
topic. Also, there's not enough research regarding the whole education system in Mongolia.

This study tries to cover the gap in the literature by applying several quantitative analysis techniques and using data from the National Statistics Office of Mongolia (NSOM) and the Ministry of Education of Mongolia (MEM).

Thus, this study has two research questions.

1. Do private secondary schools outperform public secondary schools?
2. How do school factors affect school performance?

Measurement of school performance varies a lot, such as academic achievements, exam results of students, graduation rate, and dropout rate, etc. Concerning data availability and performance indicators are chosen by most studies, in this study, school performance is measured by the exam results. Moreover, school size, class size, student-teacher ratio, teacher qualification, library and sports hall are utilised as school factors. Further explanations and details are discussed in the Methodology part of this study.

The study is one of the first empirical inquiries comparing private and public schools in Mongolia. Besides, the study is the pioneer to uses the comprehensive data set from General Entrance Exam 2017. Therefore, I hope that this research would contribute to further studies on this topic and show some empirical evidence as an example and case of developing country.

The thesis is organised in the following way. Firstly, the literature review presents a theoretical framework concerning a comparative analysis of private and public schools’ performance, and studies regarding the school performance and important factors influencing the school performance in developed and developing countries. Then, methodology part reveals a theoretical model, statistical tools to analyse, data context, and data source. After, methodology part, review of Mongolian education shows a quick timeline of education in Mongolia and current education system. Next, empirical results address research questions. This part presents data analysis, several comparisons between public and private schools, and results of multiple regression analysis. Eventually, summary part concludes the findings of this study.
2. LITERATURE REVIEW

The chapter is organised in the following way. It starts with revealing features of public and private schools. Then, it describes education privatisation trends and explores its two main types. After that, a theoretical framework is presented with the educational production function and the related literature on this topic and followed by some studies concerning the school performance, and important factors influencing the school performance in developed and developing countries. Finally, the chapter presents studies regarding Mongolian education system.

2.1. School types and education privatisation

Types of schools may vary a lot based on different characteristics, including the governance and management, finance and resources, students, and curriculum. The main two features of distinguishing public and private schools are how they're governed and financed.

Moreover, schools can be administered by public education authorities and government agencies, other government bodies or managed by non-government organisations (NGO), non-profit organisations (NPO), business entities, and other private institutions (OECD, 2012). Also, school funding can be differentiated by a couple of school financing mechanisms, such as the local and state budget, students' fees, donations and scholarships, and other (OECD, 2012).

For example, in England, there're four main types of schools, such as free schools, academies, maintained schools, and independent schools. The combinations of the curriculum, financial source, personnel management, and governance make different types of schools. For example, in the United States, there're twelve different types of schools classified on the basis of funding source, including traditional public schools, boarding schools, religious schools and private schools (National Education Association, 2013).

But, in Mongolia, there’re two types of schools, private and public. Schools that are financed and governed by the government are public schools; schools that are managed
by NGOs, NPOs, and business organisations, and are funded in whole or in part by fees and private resources are private schools (see Table 1).

### 2.1.1. Education privatisation

The private institutions have always been involved in education and been important to its management and funding. In fact, public financing of education is a relatively recent historical phenomenon. With the growth of the welfare state, the concept that the state has the primary task of providing education to all its people evolved into a political and moral duty. Most developed and developing countries accepted this idea and developed robust public education systems (Tilak, 2008).

<table>
<thead>
<tr>
<th></th>
<th>Public schools</th>
<th>Private schools</th>
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<tbody>
<tr>
<td>Management</td>
<td><em>Government</em></td>
<td><em>Actors of non-government sectors</em></td>
</tr>
<tr>
<td>Finance</td>
<td><em>Local and state budget</em></td>
<td><em>Local and state budget, student fee, donations, and other private funds</em></td>
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*Source: School classification in Mongolia*

A massive fiscal deficit, worldwide economic slowdown, high rates of unemployment, and inefficient public funding implied a need for a new idea of how governments should govern in 1970's. These fundamental factors have resulted in a ground-breaking change not just in the fashion of provision of public services and accounting for government expenditures, but also within the structures of governance. Those reforms that introducing business theories, management principles and methods in public administration came to be known as the New Public Management (NPM) (Tolofari, 2005).

Some intellectuals, including Noble winning economist Friedman (1962), promoted new ideas on how public services should be organised and delivered. Public administration, public sector and public services benchmarked business management and its principles. Friedman (1962) suggested that power must be exercised by people who create the
service; the customer ought to have the choice, and there ought to be actions of public accountability and performance.

Also, features of NPM such as large-scale privatisation, corporatisation, managerialism, marketisation, creating quasi-markets, devolution and decentralisation play the crucial role in education privatisation. These attributes were based on specific theories: public choice, transaction cost economics and principal-agent theory. Overall, as with every other market, the reforms came to the education sector too (Tolofari, 2005).

Therefore, education privatisation has become a trend that's expanding internationally. A basic overview of indicators concerning education spending confirms this trend. The percentage of enrolment in private primary and secondary school has increased in most countries, including developed and developing ones (Verger, Fontdevila, & Zancajo, 2016). Moreover, Verger et al. (2016) mention several reasons to promote education privatisation, such as (i) efficiency, (ii) effectiveness, (iii) diversification, and (iv) innovation.

Also, privatisation of education has been widely supported by governments around the world and inter-governmental organisations, transnational corporations, and non-governmental organisations (Rizvi, 2016).

There are different types of forms of privatisation. Ball and Youdell (2007) famously developed a framework for types of privatisation trends. They classified two main privatisation types:

1. "Exogenous" privatisation or *privatisation of public education*. It's about opening public education services to private sector participation. Private sectors are involved in school management and deliver education services.

2. "Endogenous" privatisation or *privatisation in public education*. It's about taking ideas, principles, and practices from the private sector to make the public sector more like businesses. (Ball & Youdell, 2007).

Table 2 shows the summary of two main privatisation types, aims, and related policies.
Table 2. Types of Education Privatisation and Associated Policies

<table>
<thead>
<tr>
<th>Type of Privatisation</th>
<th>Aim</th>
<th>Education Policies</th>
</tr>
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</table>
| **Exogenous**         | Encourage the expansion of private providers in the education market | • Liberalisation and deregulation of the education market  
                           • Tax incentives to private schools  
                           • Public subsidies to private schools  
                           • Vouchers and similar methods in which funding follows the demand |
| **Endogenous**        | Introduce private sector principles within education systems | • Performance-related pay for schools and teachers  
                           • Disaggregation of units in the educational system, school-based management  
                           • Standardised evaluation and rankings  
                           • Freedom of school in choosing policies |

*Source: Adapted from (Ball & Youdell, 2007).*

Furthermore, Verger et al. (2016) examined the privatisation of education by using the systematic literature review approach. They identified six paths toward education privatisation, such as (i) education privatisation as a state reform, (ii) education privatisation in social democratic welfare states, (iii) scaling up privatisation, the case of school choice reforms, (iv) privatisation by default in low-income countries, the case of low-fee private schools, (v) historical public-private partnerships in education, the case of some European countries, (vi) actors against education privatisation (Verger, Fontdevila, & Zancajo, 2016).

Thus, different thinkers, rationales, political and economic factors, and strategies motivate education privatisation. These elements usually associate with each other and build different education privatisation pathways in different locations (Verger, Fontdevila, & Zancajo, 2016).
2.1.2. School performance

When it comes to measuring the performance of schools, researchers choose different measurements of performance. According to National Education Association (NEA), there should be several indicators that measure the school performance. For example:

- Academic achievement (SAT, exit exam, writing tests, etc.)
- Accomplishments (graduation rates and college attendance)
- Retention/dropout rates
- Attitudes
- School safety
- Discipline
- College enrolment and completion rates, etc. (National Education Association, 2013)

But, most research concerning school performance choose the academic achievements or results of exams as the school performance indicator.

2.2. Theoretical Framework

The theoretical framework engages an educational production function approach to calculate the impact of school factors on student performance. The education production function is defined by a relationship among all combinations of inputs that produce outputs. In education production, inputs are school, teacher and student characteristics that affect outcomes. Moreover, outputs are mainly determined by academic achievements and exam scores or graduation rates. Mathematically, this could be summarised as follows (Harris, 2010):

\[ Y_i = f(S_i, S_2, ..., F_1, F_2, ..., I, E_i) \]

\( Y_i \) - educational output

\( S_i \) – school inputs
$F_i$ – family inputs

$I$ – fixed student contribution

$E_i$ – a random disturbance term that includes all the unobserved factors in the equation.

One of the main studies that employs a production function approach is the Coleman report (1966). Coleman and others thought that both school characters and the family background contribute considerably to student achievements. Thus, their specification can be written as:

\[(2) \quad Y_i = a*S_i + b* F_i + E_i\]

$Y_i$ - educational output

$S_i$ – factors relating to school and teacher inputs

$F_i$ – factors representing the family background of students

The core result of the Coleman Report was that school resources account for a small proportion of the variance of student achievements (Thapa, 2013). The subsequent research in this particular area was examining input-output relationships in school by using panel information. There is plenty of research in this field of study. Reviews by Hanushek (1989) summarise existing empirical outcomes on the education production function while showing evidence from his vote counting analyses. The main idea of vote counting is that the category with the most results is basically taken to represent the true state of the relation in question. He summarises 187 empirical specifications that focus on input and output relationships that calculate the education production function in public schools of the United States. His study analyses the impact of seven measures as inputs of education production function: expenditures per pupil, school facilities, teacher salary, teacher experience, teacher education, and teacher-pupil ratio. The main conclusion is that school expenditures do not strongly relate to student performance. Therefore, he suggests that further studies need to identify and study the connection between school inputs and outputs by using more comprehensive data.
However, Figlio (1999) estimates an education production function by using nation-wide data and finds that school inputs (i.e. student-teacher ratio, teacher salary, teacher education, etc.) are connected to student achievements. Based on his evidence, Figlio (1999) argues that impacts of school factors on student achievements might be underestimated by traditional education production function.

Hanushek (1996) argues that positive impacts of school inputs on student achievement would be biased because of the lack of data. However, Ferguson and Ladd (1996) analysed achievement scores for students in grades four, eight and nine of 131 districts in Alabama. They found that empirical results do not change whether using aggregated data of districts or individual district data. It reveals that there’s a considerable relation between school inputs and student achievements whether study uses aggregated data of districts or not.

Interestingly, Hanushek (2010) finds that the teacher-quality is the most significant factor that makes the different achievements and exam result among students across schools.

School performances have the definite connection with school management and administration. The school productivity and teacher's educational skills are improved by effective management. Also, cooperation between school and parents, and proper management of school resources have a positive effect on school effectiveness and performance (Begum & Sadruddin, 2013).

Moreover, student achievement is affected by the class size in both developing and developed countries. Darling-Hammond (2000) observed that smaller class sizes have a positive impact on student learning in his comparative study of public schools in Tennessee. In another research, Angrist (1999) shows that decreasing the number of students in the class improves the fifth-grade exam results in Israeli schools by utilising regression-discontinuity model. Then, Case and Deaton (1999) study that if the student-teacher influences school performance and student enrolment by dividing their data into races in South Africa. Their main finding is that a higher student-teacher ratio affects on math score negatively. Besides, Krueger (1999) studies the factors that influence student performance by employing Tennessee data. He finds that students from normal classes achieve lower SAT results than students from smaller classes by utilising both ordinary
least square (OLS) and two-steps least square (2SLS). Also, his study reveals that students who sit smaller classes in their early years have a constant improvement in exam results.

On the other hand, there are some studies don’t find the significant evidence that if small class size affects student performance (Hoxby, 2000). Jones (2001) checked almost 280 econometric types of research concerning the impacts of class size on student achievement. His main findings were that thirteen percent of reports show a negative connection between the smaller classes and student performance and 72 percent of the studies were statistically insignificant. Also, Asadullah (2005) studied secondary schools in Bangladesh. His study did not find a significant positive relationship between the smaller classes and student achievement. Then, he concluded that reducing the number of students in one class is not a proper policy in Bangladesh, a developing country.

Todd and Wolpin (2004) find that family inputs such as such as family income, accommodation, and a distance of school from home have the significant impact on student achievement by utilising a longitudinal dataset. They also found that school inputs are the significant effect on student performance too. Moreover, Johnstone and Johnstone (1983) examined student achievements in math and language in Indonesia. They revealed that family encouragement and support are more important than family wealth. Besides, Mohandas (2000) did the research by employing the result of Third International Mathematics and Science Study (TIMSS) 1997. His main findings were family background, age, gender, socioeconomic status affect student achievement significantly based on junior secondary students’ achievements in math and science.

Regarding the importance of teachers, Armentano (2003) argues that the most crucial impact on pupil progress is teachers and teacher qualifications. Then, socioeconomic status and school area have less importance to student progress. Furthermore, Darling-Hammond (2000) reveals that certified teaching skills and how well teachers prepare the class strongly correlates the student achievement in mathematics and reading. Banerjee et al. (2005) find that afterschool tutoring with teachers improves the student’s learning significantly in India. In addition, Kingdon and Teal (2002) conducted the research regarding the connection between student achievement and performance-related pay across Indian schools. Their main finding was that incentivised salary affects student performance positively in private schools, but not in public ones.
Concerning teacher absenteeism, Johnstone and Jiyono (1983) conducted the research and found that the teacher absenteeism rate has the most negative effect on language scores and least on math scores. Moreover, Das et al. (2005) studied the relation between teacher attendance and student performance in Zambia by utilising a panel dataset. Their main finding was that a 10 percent increase in teacher's absence rate decreased English test results by 7.5 percent and Math test results by 4 percent. Further, professor absenteeism is adversely correlated with pupil achievement while the quality of school facilities favourably impacts on secondary school performance (Suryadarma, Suryahadi, Sumarto, & Rogers, 2006). Besides, Ehrenberg et al. (1991) checked the relation between teacher absenteeism and pass rate by utilising data from schools in New York. Their core conclusion was teacher absenteeism decrease student pass rates in elementary schools, but no effect on the high school level.

One of the important studies that combine data from both developed and developing countries is by James (1987) who conducted regression analyses to explain that how different size of the private sectors influence education across some countries, such as Japan, India, Holland and the US. Her results show that the higher demand for education follows more private sector involvement at the university and secondary education level in developing countries. In developed countries, education higher demand leads to more private sector participation at primary and secondary education level in developed countries. Furthermore, on the supply side, the results indicate that the availability of entrepreneurship and openness for business entities play a vital role in both cases. However, the problem with her study is that her sample size is tiny. Also, the four countries that she has considered differ significantly regarding private sector involvement, cultural values, political system, and the development level. Therefore, the validity of the results of this study is questionable.

A similar attempt at combining data from both developed and developing countries to study the factors that affect student performance was done by Heyneman and Loxley (1983). The results from Coleman Report (1966) had suggested that school inputs had a slim effect on the student performance and that family socioeconomic characteristics of students were more important in determining academic achievement. However, Heyneman and Loxley (1983) criticised the report because the United States data cannot represent the most countries. Instead, they used data from 29 high and low-income
countries from the Second International Mathematics and Science Study (SIMSS). Their main conclusion was that the quality of the schools and teachers effectively influence student learning achievement and that this relationship is stronger in developing countries than developed countries. Also, Hanusek (1995) and Schreens (2004) found the number of resource variables strongly connected to student outcomes in developing countries.

2.2.1. Problems of education production function

The education production function approach has some limitations and problems. The major issues related to estimating educational production functions are defined by Thapa (2015) as follows:

Choice of input and output variables

When estimating education production function, which input and output variables should be chosen is still debatable and controversial. Education might have unmeasured outcomes, such as enjoyment, pleasure, happiness, and satisfaction of students and external benefits to societies as a whole.

Moreover, education does not produce a single output but multiple outcomes at the same time. Generally, Education outputs and inputs relate to many factors. Hence, it is not easy to specify and estimate results of schooling. Most studies measuring the input-output relationships in school use immediate output measures of schools, such as measured academic achievement or continuation to further schooling as a dependent variable of education production function.

The use of those measures is justified because they relate to important subsequent outcomes for individuals (i.e. Hanushek, 1989). However, some researchers doubt educational outcome measured by standardised test scores or other simple measures of student achievement (i.e. Card & Krueger, 1996).

Burtless (1996) points out that the selection of educational inputs differs from study to study, but these variables are categorised as school inputs or non-school inputs. Moreover, inputs of schools include teachers' characteristics such as academic
backgrounds, experiences, degree, and starting salaries, and classroom inputs such as class sizes, facilities, and maintenance expenditures. Non-school inputs involve family inputs (i.e., family size, income, and parental education), peer inputs (i.e. peer's demographic characteristics), and district or community factors (features of the areas where individuals attended school). On many occasions, these educational inputs are unobserved variables that are difficult to be calculated quantitatively, such as student's and peer's abilities, a relationship between students and teachers, and different teaching skills (Hanushek, 1986).

In general, previous researchers have used a substitute that is observable to capture the unobservable, in particular, IQ as a proxy of student's and peer's abilities. However, of course, there are still controversies as to if IQ is a good measure of talent.

*Levels of aggregation*

In previous literature, education production functions have been evaluated at different levels of aggregation. For example, among individuals, schools and school districts (or a similar geographical feature in other countries). Debate exists about the level of aggregation of school quality measures. Particularly, Hanushek (1997) and Betts (1995) recommended that studies that estimate school inputs by employing higher levels of aggregation overemphasise the positive effect of school inputs.

They suggest that the level of aggregation does matter. Thus, if a level of aggregation increases, positive and significant influence of school also goes up.

*Econometric biases*

Multicollinearity: There are a couple of econometric problems in estimating an education production function. Multicollinearity may appear if two or more independent variables are highly (but not perfectly) correlated. However, since multicollinearity violates none of the assumptions for establishing the absence of bias in OLS estimation, the problem is not well-defined (Wooldridge, 2009). For example, in the United States, since public schools are financed by property taxes at the local level, it is to be noted that spending per student and family income might be correlated (Thapa, 2013).
Self-selection: One of the econometric issues of Coleman's report was the self-selection problem. It is pointed out that Coleman's report observed just a snapshot in time (not a longitudinal picture). Thus, its conclusions might indicate the self-selection bias: Low-Income pupils and blacks in economically and racially integrated schools might just be a little more determined than anyone in segregated schools. But several following studies attempted to fix for this bias. Then, middle-class schools give more convenient studying environment than poverty-concentrated schools (Thapa, 2013).

Omitted variable bias: Estimated relationships between school inputs and outputs may indicate the impacts of omitted factors, rather than the true effect of inputs or school characteristics. For example, Card and Krueger's (1996) assumed that important omitted variables would be family background and features of the location near schools.

But, measuring family background is also questionable. Another critical omitted variable might be student's abilities; however, it's still in debates.

Publication bias: This problem was first addressed by Hedges et al. (1994). It notes the fact that most of the results usually published in journals are those with statistically significant results, either negative or positive. In such a case, the actual effect is hidden due to tendencies to make research reports favourable for purposes of publication (Pritchett & Filmer, 1999).

Measurement errors: If input or output variables contain measurement errors, for instance in educational attainment or achievement estimates caused by underreporting or misreporting of the educational level. That may bias the OLS estimations in any direction. In general, earnings education equations usually entail a 10 percent underestimation of rates of return due to measurement error bias (Card, 1999).

2.3. Comparison between public and private school

It is often assumed that private schools outperform public schools. But, a quick review of this statement finds different opinions on the comparison between public and private schools.
The National Assessment of Educational Progress (NAEP) examined students’ knowledge in several subjects. They concluded that private schools achieved higher points than public schools in all main subjects including maths and science (U.S. Department Of Education, 2012). In the different study, private schools perform better than public counterparts in maths, too (Lubienski C., 2006). On the other hand, National Centre for Education Statistics (NCES) published the research. It involves surprising evidence that public schools perform better than private schools (Shabbir, 2014).

In developing countries, students in public schools seem to usually achieve lower learning outcomes than their counterparts in private schools (Härmä, 2011). It could be explained by several factors. For example, the performance difference can be explained by significantly lower student-teacher ratios and lower teacher absenteeism compared to public schools. Kingdon and Banerji (2009), and Ashley et al. (2014) find that private schools have higher levels of teaching activity, more effective teaching methods, and a better learning atmosphere than public schools. Thus, more accountability of teachers might explain better teaching skills in private schools. However, there might be a strong principal-agent relationship between schools (agents) and students (principals) in private schools (Manna, 2002).

Parents and students have strong power because of tuition fees in private schools. Thus, it enables them to push schools to implement better service. Moreover, financially, private school are stronger that public schools thanks to tuition fees and other funding. Thus, this advantage provides that private schools have better learning environment, better teaching staff. Then, it leads to better educational achievements (Pedro, Leroux, & Watanabe, 2015).

Furthermore, Lubienski (2006) reveals the reasons behind higher educational achievements at private schools. He lists that higher parental participation, better-qualified teaching team, smaller classes, and better teaching conditions lead higher achievements of students. In addition, public schools have lower teaching activities than private counterparts (Tooley, Dixon, & Olaniyan, 2005). Bedi and Gang (2000) studied the effectiveness of public and private schools in Indonesia. They utilised the salary as an indicator of effectiveness. Their main finding was that private schools have better performance than public school and multiple advantages.
On the other hand, Lubienski (2014) argued that public schools actually outperform private schools. They used two nationally representative datasets and conducted the comprehensive study regarding achievement in mathematics which widely regarded to be the valid measure of school learning. Their main findings are public schools have more certified teachers, and private schools mainly work to attracting parents rather than improving teaching quality and take care of students. Also, recently, Magulod (2017) used of mixed-method research. He tried to identify the relationship between school performance and effectiveness in private and public schools. The findings of the study showed that both public and private schools have almost the same level of excellent effectiveness. However, public schools perform better than the private schools by the test results because public schools have stronger home-school relations than private schools. But, he suggested that further studies should continue to study the relationship between school effectiveness and student achievement with the wider samples and inclusion of more variables.

2.4. Mongolian education system

In the context of Mongolia, I have not found any significant empirical study regarding my research questions and comparison between public and private schools. However, there are a couple of studies concerning Mongolian education system. Also, some international organisations provide assessments and reports for the education sector.

2.4.1. Education system

According to UNESCO (2009), during the socialist time, one of the important success of Mongolia was education. Mongolian education system was similar to the former socialist and communist countries until 1990. Thus, the state controlled, regulated, planned, developed and financed the entire education system. Therefore, all levels of education were free (UNESCO, 2009).

However, education system faced a huge challenge due to the collapse of the Soviet Union in 1990’s. Indeed, there were tremendous changes in education system. In 1991, Mongolian parliament enacted the new Education Law. Thus, this law set the tone and
education reform. Every single unit of the education system was affected by the reform. For example, a governance, management, structure, and roles of teachers, etc. (Robinson, 1995).

Moreover, the Education Law (2002) enhances further reforms and a new structure of school education system was introduced and implemented by the government. Thus, school education system was changed from a ten-year system (4 years primary + 4 years lower secondary + 2 years upper secondary) to a twelve-year system (6+4+2). In addition, bachelor programs are four to six years, masters programs are one to two years, and doctorate programs require three to five years to complete at the higher education level (UNESCO, 2009) (see Figure 1).

Figure 1. Education system structure in Mongolia

Source: Adopted from (Ministry of Education of Mongolia, 2016)

2.4.2. Education system administration and Private schools

The Ministry of Education of Mongolia (MEM) is the central administrative body that is responsible for the national educational policy. Moreover, the standards for each level of formal education is set by the MEM.
Directors of schools are nominated by the school council and appointed by the governing bodies of districts and province. Representatives of the local community, students and teachers form the school council which also approves school budget and monitor schools (Ministry of Education of Mongolia, 2016).

The new Constitution of Mongolia, enacted in 1992, approves the legal framework that enables citizens found and operate private schools if they satisfy the requirements. Moreover, according to the Education Law, all levels of education can be supplied the private schools. In addition, education services are free from Value Added Tax (VAT) (UNESCO, 2009).

In Mongolia, private schools mainly crowded in urban areas. Also, private schools might provide more quality education service and better curriculum that public schools (UNESCO, 2009).

The national curriculum standards are approved by the MEM and both private and public schools must follow it. Also, private schools meet human resource, financial resource, and environmental requirements. Therefore, all schools have the same textbooks. In addition, private school can have both primary and secondary education schools (Ministry of Education of Mongolia, 2012).

### 2.4.3. Empirical studies

According to UNESCO (2008), the education sector still has a number of challenges even though several development partners and Mongolian government invest heavily in education (UNESCO, 2008). The core challenges of Mongolian education sector are:

- Improving capabilities of coordinating, planning and monitoring
- Taking care of previously separated and ignored groups
- Improving the education quality at all levels
- Decreasing performance and accessibility gaps between urban and rural areas.

Also, according to the UNESCO (2008) study, they believe that the primary challenges, which the government faces, such as human development, economic growth, and poverty could be addressed by a competent and strong education system.
Steiner-Kamsi did case study to identify four groups that are vital to the Millennium Development Goals (MDG) and Education for All (EFA) achievement in Mongolia. They are:

- Herders’ children
- Boys
- Minorities and weak children
- Out-of-school children.

Her main finding was that the risk of non-enrolment and drop-out is the highest in herder families’ boys from isolated rural areas. In Mongolian education sector, there’re enough studies regarding the inverse gender gap even though more comprehensive studies regarding why and how the combinations of school location, family income, and family background affect the education accessibility are needed (Steiner-Khamsi, 2008).

Asian Development Bank (ADB) studied Mongolian education sector, especially secondary education and they suggested followings:

- Home tutoring and home-based education for primary education should be provided in isolated rural areas
- Build more schools in urban areas. The reason is that urban population grows at the high rate.
- Considering a significant amount of internal migration, the government should develop the long-term strategies for making the balance between rural and urban education (Asian Development Bank, 2008).

Furthermore, Adiya (2010) investigated the reverse gender imbalance in Mongolian education system and found interesting results. Then, she made following recommendations addressing Mongolian education policy problems:

- The government should improve the education accessibility for poor and disadvantaged male students in primary and secondary education.
- The government has to strengthen regulations against child labour and policies that support low-income families' children.
- Mongolian universities should move towards research institutions.
The government needs to improve the higher education quality, monitoring and accreditation standards (Adiya, 2010).

According to her research, the gender imbalance in education sector may affect families and society negatively if it continues long enough. Also, the reverse gender gap in the education sector may result in more unemployed and unskilled Mongolian men struggle to support their family. Policymakers should take action to decrease the gender imbalance in higher education otherwise it could be so harmful. Overall, a significant number of male students might be unable to meet the growing labour market requirements and demand (Adiya, 2010).

Jacob et al. (2014) studied the situation of post-primary education in Mongolia. They categorised their findings into three clusters and made recommendations:

- To guarantee sustainable growth, economic security, and decrease the huge dependence on mining industry
- To develop the platform for the transition from school to work and improve and redefine school standards
- To improve the quality of post-primary education that making poor learning outcomes and couldn’t keep pace with increasing demand.

Also, they found that education sector faces a significant shortage of qualified and skilled teachers and examinations are not transparent enough due to lack of clear standards. Thus, there is a need to improve the teacher training system comprehensively and as well the standards of teacher accreditation system. Besides, they revealed that there’re large difference between student performance in urban and rural schools. Students struggle to solve complex and analytical tasks (Engel, Prizzon, & Amgaabazar, 2014).

In addition, The World Bank did research on Pre-Primary Education in Mongolia. The most interesting findings of their report are:

- Household wealth is a fundamental determinant of preschool enrolment, with children from low-income families almost 40 percentage points less likely to enrol in preschool than those from the wealthier families.
- Herders' children remain underrepresented in the system, relative to their share of the country's population (The World Bank, 2017).

Moreover, this report addressed the problems of equity in Mongolian pre-primary education system.

2.5. Research gap

In developed countries, comparison of the performance of public and private schools is studied sufficiently. But, there’re still debates, such as choice of input and output variables, levels of aggregation, and how to deal with econometric biases. In developing countries and emerging economies, the topic is understudied.

The topic regarding my research questions is not studied comprehensively in Mongolia. Furthermore, only a few types of research examine the entire education system in Mongolia.

Therefore, I am convinced this thesis can provide a contribution to the study field in Mongolian education system and also give some empirical evidence about the topic as an example and case of emerging economy.
3. METHODOLOGY

This part is organised in the following way. Firstly, it introduces research questions and hypotheses. After that, it reveals methods to answer research questions. Then, it shows theoretical model and statistical tools to analyse hypotheses and research questions. It's followed by data context and data source. After that, this part shows variable description and characteristics. Lastly, this part reveals the limitation of this study.

This study has two research questions.

1. Do private secondary schools outperform public secondary schools?
2. How do school factors affect school performance?

Therefore, the followings are hypotheses of the study.

Hypothesis 1: Private schools perform better than public schools.

As discussed in the literature review, school performance could be measured by plenty of indicators. But, in most studies, student performance or student academic achievement is employed as school performance indicator. Moreover, student performance is usually measured by standardised exam results. Choosing standardised exam results has plenty of advantages. For example, it is adequate, comparable and as well measuring the output of school. Thus, this study uses student performance based on the result of General Entrance Exam (GEE) as school performance.

* GEE is utilised as the key data of this thesis. Simply, GEE is Mongolian SAT (Scholastic Assessment Test is a test widely used for higher education admission in the United States) type exam and mandatory requirement of entering any University. This exam was introduced in Mongolian education system in 2006 and consists of 10 different subjects, including Math, Mongolian, English, Physics, Chemistry, Biology, Geography, Mongolian History, and Social Science. It's administered and controlled every year by the Education Evaluation Centre, the agency of Mongolian government. In each academic end of the year, students, who graduate secondary school, take the exam.
Hypothesis 2:

Based on suggestions of studies discussed in the literature review; school size, class size, student-teacher ratio, teacher qualification, library and sports hall are utilised as school factors that affect school performance. Therefore, Table 3 shows hypotheses regarding the second research question based on the literature review.

Table 3. Hypotheses of school factors

<table>
<thead>
<tr>
<th>School feature</th>
<th>Description</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>School size</td>
<td>High total number of students</td>
<td>Affects student performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>positively</td>
</tr>
<tr>
<td>Class size</td>
<td>High average number of students in one class</td>
<td>Affects student performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>negatively</td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>High number of students per one teacher</td>
<td>Affects student performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>negatively</td>
</tr>
<tr>
<td>Teacher qualification</td>
<td>High percentage of teachers who are senior</td>
<td>Affects student performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>positively</td>
</tr>
<tr>
<td>Library</td>
<td>School has at least one library</td>
<td>Affects student performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>positively</td>
</tr>
<tr>
<td>Sports hall</td>
<td>School has at least one sport hall</td>
<td>Affects student performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>positively</td>
</tr>
</tbody>
</table>

Source: Adopted from the literature review

3.1. Method

Basically, two research questions require two different type of method. But, in both of them the approach is quantitative data analysis. In order to answer the first research question, this study used descriptive statistical tool, after that, to answer the second research question, the study employed multiple regression that would be classified as exploratory type method.
3.1.1. **Comparison**

The method to this section is to test the hypothesis that students from private schools perform better than students from public schools.

First step of analysis is comparison between public and private schools based on the school performance data (GEE results).

In this study, I decided to examine urban schools. The main reason is that to analyse and compare more precisely. There are significant differences between urban and rural students' performance (Engel, Prizzon, & Amgaabazar, 2014), and almost 90 percent of private schools locate in the urban area. Also, UNESCO report (2008) recommended that decreasing performance and accessibility gaps between urban and rural schools.

Furthermore, I made various comparisons between private and public schools. For example, comparing public and private schools by average GEE results, result of each GEE subject, and districts. Also, I compared public schools that have more state support and better academic tradition with private schools.

Besides, variance of GEE result was checked and compared between public and private schools.

3.2. **Model**

As mentioned above, this thesis uses the theory of the educational production function in calculating the impacts of school factors on students' performance.

Based on results and suggestions of Figlio (1999), Case and Deaton (1999), Darling-Hammond (2000), Hanushek (2010) studies, school characters affect student performance significantly. Also, in Mongolian education system, there’s no aggregated data regarding student background. To take above mentioned arguments into account, the model proposes that the performance of school "i" is given by the following reduced form expression:

\[
Y_i = a*S_i + E_i
\]
Dependent variable:

\[ Y_i \] - educational output – average of GEE exam results of students

Independent variable:

\[ S_i \] – factors relating to school and teacher inputs – school characters, such as student-teacher ratio, teacher qualification, library capacity, etc.

\[ E_i \] - random disturbance with mean zero and constant variance.

Furthermore, based on results and suggestions of studies discussed in literature review (i.e. Figlio (1999), Case and Deaton (1999), Darling-Hammond (2000), Hanushek (2010), I choose school characters as independent variables as shown in the following table:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>School size</td>
<td>Total number of students</td>
<td>SS</td>
</tr>
<tr>
<td>Class size</td>
<td>Average number of students in one class</td>
<td>CS</td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>Number of students divided by number of teachers</td>
<td>TR</td>
</tr>
<tr>
<td>Teacher qualification</td>
<td>Percentage of teachers who are senior</td>
<td>TQ</td>
</tr>
<tr>
<td>Library</td>
<td>Whether school has at least one library or not</td>
<td>LB</td>
</tr>
<tr>
<td>Sport hall</td>
<td>Whether school has at least one sport hall or not</td>
<td>SH</td>
</tr>
</tbody>
</table>

Source: Adopted from the literature review

Thus, symbolically, the model proposes that the performance of school "i" is explained by the following expression:

\[
(4) \ SP_i = \text{Constant} + a_1*S_{Si} + a_2*C_{Si} + a_3*T_{Ti} + a_4*T_{Qi} + a_5*L_{Bi} + a_6*S_{Hi} + E_i
\]
The dependent variable in this case is the average of GEE exam results of students, which is a continuous variable. The Ordinary Least Squares (OLS) regression method is employed to estimate equation (4).

3.3. Data

As the data analyses concerning both research question uses the same data sets, this chapter is devoted to an explanation of data set.

The data for this study came from Ministry of Education of Mongolia (MEM) and National Statistics Office of Mongolia (NSOM). I used result of GEE 2017.

3.3.1. Variable Description

The dependent variable examined in the OLS model is the GEE score of average score of students (ER). More precisely, this student outcome variable is a continuous variable that includes the average score of total ten subjects, which are Math, Mongolian, English, Physics, Chemistry, Biology, Geography, Mongolian History, Social Science, and Russian. Further, the ER variable is converted to a scale of 100.

The literature suggests that classes have fewer students (CS) contribute positively to student learning (i.e. Darling-Hammond, 2000). Because, if classes are smaller, teachers can have more time for each student. Thus, it can increase the effectiveness of teacher and improve student performance.

Also, according to the literature, because of economies of scale, bigger schools or schools having more students have better resources (SS) even though they could also be less productive in terms of educational outcome. Thus, I have included student-teacher ratio (TR) which are important in explaining student achievement (Case & Deaton, 1999).

Furthermore, since teachers are key to spread knowledge to students, teacher qualification (TQ) and teacher experience are important variables to control for any analysis involving student performance (i.e Hanushek, 2010).

In addition, Library (having library=1, not having=0) and sport hall (having sport hall=1, not having=0) are used as a proxy for school resources (LB, SH). There is controversy in
the developed countries about the significance of the contribution of school resources towards student achievement; however, there is almost no doubt about its influence in developing countries (i.e. Hanushek, 1995; Scheerens, 2004).

Also, data for comparison analysis consist of each subject score of GEE.

Table 5. Variable description

<table>
<thead>
<tr>
<th>Variable Description</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math results of GEE</td>
<td>SPM</td>
</tr>
<tr>
<td>Mongolian language results of GEE</td>
<td>SPL</td>
</tr>
<tr>
<td>English results of GEE</td>
<td>SPE</td>
</tr>
<tr>
<td>Physics results of GEE</td>
<td>SPP</td>
</tr>
<tr>
<td>Chemistry results of GEE</td>
<td>SPC</td>
</tr>
<tr>
<td>Biology results of GEE</td>
<td>SPB</td>
</tr>
<tr>
<td>Geography results of GEE</td>
<td>SPG</td>
</tr>
<tr>
<td>Mongolian history results of GEE</td>
<td>SPH</td>
</tr>
<tr>
<td>Social Science results of GEE</td>
<td>SPS</td>
</tr>
<tr>
<td>Russian results of GEE</td>
<td>SPR</td>
</tr>
</tbody>
</table>

Source: Adopted from GEE
3.4. Limitation

This study is one of pioneer studies regarding the topic and research questions in Mongolia. Thus, definitely, the study has the limitations. Two main limitations are explained.

Performance measurement.

Education output can be interpreted by a large number factors and indicators. Also, education has a lot of unobservable benefits, such as joy, happiness, satisfaction, reputation, and so on. Moreover, school performance can be interpreted by so many different measurements, such as graduation rate, admission rate, and etc. Then, in this study, education production function measured as school performance. School performance is measured by average result of GEE 2017.

Lack of data.

Further, in this type of studies, we should include family and student background characters in the education production function. But, in this study, due to the lack of data, I couldn’t estimate family and student characters. But, in the estimation model, $E_i$ and “Constant” contain sum of unobserved factors.
4. COUNTRY OVERVIEW

Mongolia is the most sparsely inhabited country in the world. The population is about 3.2 million and almost half of them live in Ulaanbaatar, the capital city. Mongolia locates in Central Asia between Russia and China. The total area is 1.56 million sq.km. It’s a landlocked country and lower-middle income country. In last year, GDP per capita is 3720 US dollars (National Statistical Office of Mongolia, 2018).

Mongolia shifted from socialism to democracy and from the planned economy to the market-driven economy after the Soviet Union collapse. The transition was so harsh to the whole country.

From 1924 to 1990, the Soviet Union’s aid covered almost 30 percent of Mongolia’s annual Gross Domestic Product (GDP) because of the close economic tie between two countries (Robinson, 1995).

In early 1990’s, Mongolian government initiated policies to reform its economy. The government started to build the market economy fundamentals by removing huge subsidies, liberalising prices, privatising public companies, public apartments, public animal herds and farms, and as well the land. The share of the private sector reached more than 70 percent of GDP because of those policies (Enkhbayar, 2007). Moreover, Mongolia recovered well and stabilised their economy by 2000. It gave a robust platform for further economic growth, and the economy grows continuously.

The political transition was peaceful and smooth. According to (World Bank, 2013), Thus, Mongolians enjoy more political freedom than citizens of any other former communist countries in Central Asian. Like other sectors, the government transformed the education system from the Soviet-style to a market orientation.

Mongolia still has some deep problems such as unemployment and poverty after almost three decades of shift approaching the free-market economy. For example, in 2015, nearly 23 percent of Mongolians lived below the poverty line. But, overall, Mongolia moves up. In 2006, Mongolia was ranked at the 116th place by Human Development Index (HDI). After a decade later, in 2016, Mongolia improved its HDI to the 92nd place (National Statistical Office of Mongolia, 2017).
4.1. Education Expenditure and Finance

The central government is the primary financer of general education, although it is funded by local budgets and students' tuition fees. According to the Education law, at least twenty percent of the government budget shall be distributed to education. But, it does not reach that level, i.e. education expenditure was 12.8 percent of the government budget in 2016 (see Figure 2). Last three years, education expenditure has been growing gradually.

*Figure 2. Expenditure on education as % of total government expenditure*

The education financing procedure of the government utilising the per-student cost formula. It’s based on two costs such as fixed and variable cost. Fixed costs involve water, electricity, heating and sewage. On the other hand, salary, bonus, supplements, insurance, and taxes are the variable cost (Asian Development Bank, 2008).

Comparatively, public expenditure on education in Mongolia is higher than the regional average (Central Asia) and the European Union (EU) average and as well the world average (4.6%) (see Table 6).
Table 6. Public spending on education, percentage of GDP in central Asia

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mongolia</td>
<td>n/a</td>
<td>4.9</td>
<td>5.7</td>
<td>4.9</td>
<td>5.1</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>n/a</td>
<td>4.1</td>
<td>2.8</td>
<td>2.7</td>
<td>3.1</td>
</tr>
<tr>
<td>Kyrgyz Republic</td>
<td>5.6</td>
<td>5</td>
<td>4.2</td>
<td>5.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>8.2</td>
<td>2.2</td>
<td>2.5</td>
<td>3.6</td>
<td>3.9</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>9.5</td>
<td>7.4</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Hungary (2015)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.2</td>
</tr>
<tr>
<td>EU-28 average (2015)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.9</td>
</tr>
</tbody>
</table>

Source: Data collected from World Bank data

4.2. Education Competitiveness

Global competitiveness index is measured by the World Economic Forum (WEF) annually. There are some sub-pillars and indicators relating to the education sector. Health and primary education, and higher education and training are the main measurements of education competitiveness. Thus, former is at 85th and later is at 65th in the world by competitiveness. In addition, Mongolia was ranked at the 101st place with overall performance 3.9 out of seven in 2017 (see Figure 3).

Although school enrolment rate is relatively high (enrolment rate of primary education at 56th, secondary education at 72th, and tertiary education enrolment at 29th in the world), education quality is still problematic. Notably, quality of education is 116th, and quality of management schools is 132nd in the world. It implies that government may focus on
the quality of education. Also, in the higher education sector, the majority of schools are business and management schools. But, quality is not that good.

In addition, quality of math and science education is relatively competitive with the rank at 56th in the world.

*Figure 3. Mongolian competitiveness*

*Source: Adopted from (WEF, 2018)*
5. EMPIRICAL RESULTS

This part is organised in the following way. Firstly, it shows descriptive statistics of data and its meaning. After that, it presents analysis regarding two research questions and empirical results and explanations.

5.1. Descriptive statistics of data

This study used a comprehensive set of data including all schools (both public and private) operating in the urban area. I utilised a result of GEE 2017.

For public schools, performances of subjects vary from 44.79-51.91 (see Table 7). Since the maximum point is 100, this result does not seem good. Public school students slightly score better at Geography, Mongolian, and Social Sciences than other subjects. But, in science subjects, such as Math, Physics, and Chemistry, their performance doesn't reach 50 percent level. Thus, it may imply that the government gives the attention to improve general science subjects. Perhaps, these results might reveal a low quality of education.

Considering variances of results of subjects, Russian has the highest variance. On the other hand, Mongolian, Social Science, and Math have the lowest variance. Thus, we could say that, in public schools, the difference of Russian language knowledge is the highest among public school students. It could express that teaching quality of Russian language deteriorates since Russian influence has decreased in Mongolia. In contrast, in public schools, students have equal knowledge of Mongolian language, Social Science and Math.

Table 7. Descriptive statistics of Public schools

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Variance</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average of all subjects</td>
<td>48.40</td>
<td>14.40</td>
<td>9.71</td>
<td>87.91</td>
</tr>
<tr>
<td>Mongolian</td>
<td>50.71</td>
<td>9.58</td>
<td>9.53</td>
<td>85.13</td>
</tr>
<tr>
<td>Math</td>
<td>47.51</td>
<td>10.69</td>
<td>16.19</td>
<td>94.72</td>
</tr>
<tr>
<td>English</td>
<td>49.77</td>
<td>14.85</td>
<td>5.22</td>
<td>94.09</td>
</tr>
<tr>
<td>Physics</td>
<td>48.90</td>
<td>13.25</td>
<td>18.94</td>
<td>91.80</td>
</tr>
<tr>
<td>Chemistry</td>
<td>46.67</td>
<td>13.17</td>
<td>0.31</td>
<td>84.25</td>
</tr>
<tr>
<td>Biology</td>
<td>47.90</td>
<td>14.12</td>
<td>3.94</td>
<td>90.26</td>
</tr>
</tbody>
</table>
Private schools' performances of subjects vary from 46.99-70.06 (see Table 8). They perform higher than 50 percent level, except geography. Also, results reveal how private schools are good at teaching foreign languages because most private schools have more teaching time for foreign languages. Their performance in English is 70 and Russian is 68 points.

Moreover, in science subjects, such as Math, Physics, and Chemistry, they perform well too. Results are around 60 percent level. It expresses that private schools can provide a good quality general science subjects.

Considering variances, the knowledge difference of Geography, Biology, and Russian language subjects are higher than other subjects among private school students.

On the other hand, in private schools, students have equal knowledge of Mongolian language, Social Science, Chemistry, English, and Math.

| Table 8. Descriptive statistics of Private schools |
|---------------------|----------|----------|------|------|
| Variable            | Mean     | Variance | Min  | Max  |
| Average of all subjects | 57.87    | 21.12    | 9.32 | 95.82 |
| Mongolian           | 53.42    | 16.44    | 3.88 | 83.48 |
| Math                | 59.42    | 20.00    | 2.97 | 91.79 |
| English             | 70.06    | 20.17    | 23.41| 98.17 |
| Physics             | 61.87    | 22.33    | 13.50| 99.35 |
| Chemistry           | 58.72    | 19.20    | 11.27| 94.23 |
| Biology             | 56.87    | 24.01    | 8.76 | 99.21 |
| Social science      | 52.17    | 11.40    | 14.10| 94.97 |
| Geography           | 46.99    | 27.33    | 4.46 | 98.82 |
| History of Mongolia | 50.51    | 23.45    | 8.74 | 99.03 |
| Russian             | 68.71    | 26.87    | 2.16 | 99.19 |

Source: Author's calculation
In the 2017-2018 academic year, 91 percent of schools have their library; meanwhile, 79 percent have sports hall. The biggest school has more than 4300 students, but, the smallest one has only 16 students (see Table 9).

Moreover, average one class has about 27.5 students, and the most crowded school has approximately 39.5 students in one class. Furthermore, normally, one teacher has almost 18 pupils to teach.

In addition, 27 percent of teachers have some certificate or degree beyond the bachelor.

Table 9. Descriptive statistics of School characters.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Variance</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>School size</td>
<td>1248.40</td>
<td>1025.30</td>
<td>16</td>
<td>4327</td>
</tr>
<tr>
<td>Class size</td>
<td>27.50</td>
<td>10.32</td>
<td>7.3</td>
<td>39.5</td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>17.96</td>
<td>7.05</td>
<td>2.7</td>
<td>34.2</td>
</tr>
<tr>
<td>Teacher qualification</td>
<td>0.27</td>
<td>0.13</td>
<td>0.06</td>
<td>0.84</td>
</tr>
<tr>
<td>Library</td>
<td>0.91</td>
<td>0.28</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sport hall</td>
<td>0.79</td>
<td>0.41</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Author’s calculation

Concerning the number of schools operating, there's a gradual decrease in a number of private schools. On the other hand, the number of public schools increases as well. Because of the mining boom and commodity (mainly coal, copper, steel, and gold) price rise, the government has the capability to build new schools. That's why, last ten years, number of public schools increases.

The number of private schools decreased sharply from 2008 to 2014. Since 2014, the number of private schools is almost constant. In 2008, the world financial and economic crisis hit Mongolian economy harshly. Then, it affected private sector enormously. That's why, the same as other economic sectors, some private entities couldn't run their schools. Some of them left the market, and some of them merge each other to decrease the operating cost and use the economies of scale. But, recently, thanks to the economic stabilisation, the number of private schools doesn't fall (see Figure 4).
Considering the number of students who study at public schools, there's a sharp decrease from 2008-2013 and a significant increase from 2014-2017 (see Figure 5). The demographic change would explain the decline in the number of students. Students who studied 2000's and early 2010's were born in 1990's. Because of transition from socialism to democracy and centrally planned economy to market-oriented economy, the birth rate declined significantly. Also, the increase could be explained by the demographic change and the shift from ten-year system to twelve-year system in public education sector.

Figure 5. Number of students who study at public and private schools

Source: Adopted from (National Statistical Office of Mongolia, 2018)
On the other hand, the number of private school students decreased from 2009-2011 but increases continuously from 2011. The economic crisis and demographic change could explain the decrease. Although the number of private schools lowered, the number of students who study at private schools increases. It may imply that some private schools merged due to the economic crisis in order to increase the efficiency, capacity and competitiveness.

5.2. Performance of public and private schools

To answer the first research question and check the first hypothesis, I used the different comparisons based on the GEE results such as comparing public and private schools by overall average, individual subject and the location. The reason is that results could vary across the subjects and as well location of schools.

5.2.1. Comparison of averages of all subjects

Based on Figure 6, it shows that private schools outperform public schools by far. The difference is almost 10 points. The average result of private schools' students stands at 58 while public school only overcomes 48 (Figure 6).

*Source: Author's calculation*
As most of developing countries' cases, private schools perform better than public ones in Mongolia. But, that huge difference may imply that pupils don't have an equal chance to get a decent education. It may have the negative consequences in the long term, such as more segregation, less equity, and more difference between the poor and the riches.

Therefore, based on the overall average, we could say that the first hypothesis is supported by Figure 6.

5.2.2. **Comparison by each subject**

According to the overall comparison, private schools seem far better than public schools. Furthermore, I compared public and private schools by subjects (see Figure 7).

*Figure 7. Public and private schools’ comparison by subjects*

Then, private schools still dominate public schools in all subjects, except Geography (Figure 7). Especially, private schools are far better at English and Russian. The difference is more than 20 points. Moreover, in Math, Physics, and Chemistry, private schools are 10 points ahead of public counterparts. Therefore, this comparison reveals that private schools are much more effective than public schools in the core science
subjects (Math, Physics, and Chemistry) and language classes. Thus, education policy should take their attention to these results and consider them in further policies.

5.2.3. Comparison top schools by each subject

Besides comparing public and private schools, collecting comprehensive data brings an opportunity to compare top schools. Thus, based on GEE 2017 data analysis, I've ranked schools. Although, generally, private schools perform better than public schools at some distance, some public schools outperform public schools in some GEE subject results.

Mongolian language

Erdem Tugs and UB Empathy are leading in the field of Mongolian language from private schools. These two schools have more focus on the Mongolian language than other private schools. Public schools such as School 11, School 93, School 1, and School 1 are mostly on top because they’ve historically excellent Mongolian language teachers and good tradition. Although, private schools are better than public schools, leading two public schools are better than private schools in GEE Mongolian Language subject. Furthermore, School 11 is the top school including private schools by GEE Mongolian language test score.

Table 10. Top-5 schools by GEE Mongolian language 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Erdem Tugs</td>
<td>School 11</td>
</tr>
<tr>
<td>2</td>
<td>UB Empathy</td>
<td>School 93</td>
</tr>
<tr>
<td>3</td>
<td>Hobby</td>
<td>School 14</td>
</tr>
<tr>
<td>4</td>
<td>Sant</td>
<td>School 1</td>
</tr>
<tr>
<td>5</td>
<td>Naran</td>
<td>School 24</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

Math

Students in Oyunlag and Sant have a choice to continue Mathematics lesson in an intensified class, which is a higher level or, standard level Mathematics class. Therefore, they are leading the rank from private schools. Public schools such as School 11 and, School 1 also has the same possibility to participate in an intensified higher-level Mathematics class. Moreover, Cambridge standard flagship public schools (Mongol Temuulel, Shine Erin, Shine Ekhlel) also have intensified Math classes. Thus, School 11
and Cambridge standard flagship public schools perform excellently and could compete with private schools. Even School 11 is the leading school including both private and public schools by GEE Math result.

Table 11. Top-5 schools by GEE Math 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oyunlag</td>
<td>School 11</td>
</tr>
<tr>
<td>2</td>
<td>Sant</td>
<td>Mongol Temuulel</td>
</tr>
<tr>
<td>3</td>
<td>Shine Mongol</td>
<td>Shine Erin</td>
</tr>
<tr>
<td>4</td>
<td>Hobby</td>
<td>Shine Ekhlel</td>
</tr>
<tr>
<td>5</td>
<td>Tugs Delgerekh</td>
<td>School 1</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

**English**

Private schools such as Orchlon, Hobby and, Kings Kids leads the field of English in spite of having an intensified English class and learning most subjects in English. On the other hand, Shine Ekhlel, Shine Erin, Mongol Temuulel, School 11, and School 93 leads the public schools. Again, flagship public schools show that they can perform the same as private schools which have high tuition fees. But, overall, private schools outperform public schools in GEE English results.

Table 12. Top-5 schools by GEE English 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orchlon</td>
<td>Shine Erin</td>
</tr>
<tr>
<td>2</td>
<td>Hobby</td>
<td>Shine Ekhlel</td>
</tr>
<tr>
<td>3</td>
<td>Kings Kids</td>
<td>Mongol Temuulel</td>
</tr>
<tr>
<td>4</td>
<td>ESM International</td>
<td>School 11</td>
</tr>
<tr>
<td>5</td>
<td>Absolute Elit</td>
<td>School 93</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

**Physics**

Private schools such as Orchlon, Sant, Shine Mongol, and Oyunlag leads the rank in the field of Physics. Sant school has an advantage of preparing their students by taking an online open course from MIT (Massachusetts Institute of Technology). Orchlon school hired excellent Physics teachers. The school Shine Mongol has more focused on Physics class because their goal is to support engineers. Flagship public schools and School 11 have the most distinguished and experienced teachers among public schools. But, in GEE Physics result, private schools outperform public schools.
### Table 13. Top-5 schools by GEE physics 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orchlon</td>
<td>Shine Erin</td>
</tr>
<tr>
<td>2</td>
<td>Oyunlag</td>
<td>School 11</td>
</tr>
<tr>
<td>3</td>
<td>Sant</td>
<td>Mongol Temuulel</td>
</tr>
<tr>
<td>4</td>
<td>Shine Mongol</td>
<td>School 24</td>
</tr>
<tr>
<td>5</td>
<td>Goethe</td>
<td>School 93</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

### Chemistry

Private schools such as Sant, Shine Mongol and UB Empathy take more intensified classes in Chemistry, to achieve high scores. That’s these three schools leading private schools. Cambridge standard public schools lead public schools. Because they have more intensified classes. Also, School 11, School 24, and School 1 have experienced teachers and are usually good at Chemistry. Two public flagship schools perform better than private schools, except Sant and Shine Mongol, in GEE Chemistry results.

### Table 14. Top-5 schools by GEE Chemistry 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sant</td>
<td>Shine Ekhlel</td>
</tr>
<tr>
<td>2</td>
<td>Shine Mongol</td>
<td>Shine Erin</td>
</tr>
<tr>
<td>3</td>
<td>UB Empathy</td>
<td>School 11</td>
</tr>
<tr>
<td>4</td>
<td>Bolor</td>
<td>School 24</td>
</tr>
<tr>
<td>5</td>
<td>Ulaanbaatar</td>
<td>School 1</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

### Biology

In GEE Biology results, Oyunlag and Sant schools lead all schools. But, again, two flagship public schools outperform private schools, except leading two schools. Moreover, School 1, School 59 and School 93 express they could compete against private schools in Biology.

### Table 15. Top-5 schools by GEE Biology 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oyunlag</td>
<td>Shine Erin</td>
</tr>
<tr>
<td>2</td>
<td>Sant</td>
<td>Shine Ekhlel</td>
</tr>
<tr>
<td>3</td>
<td>Orchlon</td>
<td>School 1</td>
</tr>
<tr>
<td>4</td>
<td>Nomch</td>
<td>School 59</td>
</tr>
<tr>
<td>5</td>
<td>Hobby</td>
<td>School 93</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis
History of Mongolia

In GEE History of Mongolia results, Sant leads all school. Private schools such as UB Empathy and Etugen tries to imply an idea that a Mongolian person has to know the Mongolian history identity and they have more focused classes in History of Mongolia than other private schools. Public schools such as School 47, School 115, and School 1 have the most experienced teachers to teach them well. Again, private schools outperform public schools by GEE History of Mongolia results.

Table 16. Top-5 schools by GEE History of Mongolia 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sant</td>
<td>School 47</td>
</tr>
<tr>
<td></td>
<td>99 points</td>
<td>86 points</td>
</tr>
<tr>
<td>2</td>
<td>Orchlon</td>
<td>School 15</td>
</tr>
<tr>
<td></td>
<td>94 points</td>
<td>76 points</td>
</tr>
<tr>
<td>3</td>
<td>Olonlog</td>
<td>School 120</td>
</tr>
<tr>
<td></td>
<td>90 points</td>
<td>74 points</td>
</tr>
<tr>
<td>4</td>
<td>Etugen</td>
<td>School 115</td>
</tr>
<tr>
<td></td>
<td>88 points</td>
<td>72 points</td>
</tr>
<tr>
<td>5</td>
<td>UB Empathy</td>
<td>School 1</td>
</tr>
<tr>
<td></td>
<td>82 points</td>
<td>70 points</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

Social Science

Schools such as Oyunlag, UB Empathy, Mongol Temuulel, and School 93 have optional extra intensified Social Science classes. Moreover, they have debate clubs to make sure the students have fully understood about Social Science. In addition, two flagship schools again show good results and Mongol Temuulel outperforms all schools, except Oyunlag, in GEE Social Science results. Overall, private schools’ performance better than public counterparts.

Table 17. Top-5 schools by GEE Social Science 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oyunlag</td>
<td>Mongol Temuulel</td>
</tr>
<tr>
<td></td>
<td>94 points</td>
<td>90 points</td>
</tr>
<tr>
<td>2</td>
<td>Sant</td>
<td>Shine Erin</td>
</tr>
<tr>
<td></td>
<td>87 points</td>
<td>83 points</td>
</tr>
<tr>
<td>3</td>
<td>UB Empathy</td>
<td>School 11</td>
</tr>
<tr>
<td></td>
<td>85 points</td>
<td>79 points</td>
</tr>
<tr>
<td>4</td>
<td>Erdem Tugs</td>
<td>School 93</td>
</tr>
<tr>
<td></td>
<td>85 points</td>
<td>76 points</td>
</tr>
<tr>
<td>5</td>
<td>Absolute Elit</td>
<td>School 24</td>
</tr>
<tr>
<td></td>
<td>84 points</td>
<td>73 points</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

Geography

The overall performance of Geography is the worst in GEE 2017 results. Generally, private schools better than public ones. But, School 97 and School 73 indicates that they could outperform most private schools in GEE Geography.
Table 18. Top-5 schools by GEE Geography 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sant</td>
<td>School 13</td>
</tr>
<tr>
<td>2</td>
<td>Setgemj</td>
<td>School 73</td>
</tr>
<tr>
<td>3</td>
<td>Shine Mongol</td>
<td>School 26</td>
</tr>
<tr>
<td>4</td>
<td>Raduga</td>
<td>Amgalan complex</td>
</tr>
<tr>
<td>5</td>
<td>UB Empathy</td>
<td>School 47</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

**Russian**

Private schools such as Mongolian Russian Joint School 3, Shine Ue, Hobby and Absolute Elit teach the students intensively to speak Russian. On the other hand, public schools such as School 23, and School 1 have more experienced Russian language teachers to teach well.

In general, private schools are better than public schools in GEE Russian results. But, flagship public school and other leading public schools show that they can perform well in GEE Russian.

Table 19. Top-5 schools by GEE Russian 2017

<table>
<thead>
<tr>
<th>#</th>
<th>Private schools</th>
<th>Public schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shine Ue</td>
<td>Shine Erin</td>
</tr>
<tr>
<td>2</td>
<td>UB Empathy</td>
<td>School 23</td>
</tr>
<tr>
<td>3</td>
<td>Hobby</td>
<td>School 1</td>
</tr>
<tr>
<td>4</td>
<td>Absolute Elit</td>
<td>School 38</td>
</tr>
<tr>
<td>5</td>
<td>Mongolian Russian Joint school 3</td>
<td>School 11</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s analysis

**5.2.4. Comparison by districts**

Using comprehensive data set, I compared districts by both public and private school performance.

This comparison gives interesting results. We can see that location hardly influences private school performance. It implies that private schools compete with each other well and they can be competitive not depending on their area (see Figure 8).

But, public school performance varies district to district significantly. Bayangol and Sukhbaatar districts have more apartment micro-districts and fewer suburbs (ger khoroooolol). Thus, pupils who study in Bayangol and Sukhbaatar district schools are likely
to have more educated family background than those who study in other districts. Therefore, the family background might affect student performance.

*Figure 8. Comparison by districts based on average GEE results*

Source: Author’s calculation

5.2.5. **Comparison by public schools in the apartment micro-districts and all private schools**

Now, it's obvious that private schools outperform public schools. But, in the comparison pool, all types of public schools are included. Thus, one thing is interesting that what if we compare public schools in the apartment micro-districts (these public schools are usually resourceful and have a good academic record) with private schools.

According to the comparison as mentioned above, those chosen public schools outperform private schools at Mongolian language, Geography, and Social science. But, in other subjects, private schools are still better than public schools. In details, those chosen public schools perform better than public schools in the Mongolian language by four points, at Geography by eight points, at Social science by five points. On the other hand, private schools are better at Russian by 12 points, at Math by five points, at English by eight points, at Physics by seven points, and at Chemistry by three points than public ones.
In this comparison, the differences are relatively low. The highest difference is 12 in Russian, but in Math, Physics, and Chemistry, differences are not more than five.

Overall, even set of chosen public schools still cannot outperform private counterparts (see Figure 9).

*Figure 9. Comparison between private schools and schools*

![Comparison between private schools and schools](image)

*Source: Author’s calculation*

Based on different comparisons, certainly, private schools perform better than public schools in Mongolia. Thus, this study confirms the first hypothesis. Therefore, private schools perform better than public schools in Mongolia.

### 5.3. School factors influencing school performance

To answer the second research question and check related hypotheses, I utilised education production function and multiple regression models.

As discussed in the Methodology part, the following equation was estimated.

\[
SP_i = \text{Constant} + a_1*SS_i + a_2*CS_i + a_3*TR_i + a_4*TQ_i + a_5*LB_i + a_6*SH_i + E_i
\]

To estimate the (4) equation, I used the OLS regression method.
The data for this estimation came from MEM and NSOM. The study used the result of GEE 2017.

As I use cross-sectional data and multiple regression analysis methods, in order to do BLUE (Best Linear Unbiased Estimator) estimation, I check heteroscedasticity and multicollinearity problem.

5.3.1. Heteroscedasticity

If there is heteroscedasticity, then the OLS estimates are no longer considered BLUE (Best Linear Unbiased Estimator). In other words, the appearance of heteroscedasticity means that OLS does not provide the calculation with the smallest variance.

Then, to check this, I plot residuals against the fitted values and visually examine for heteroscedasticity. Figure 10 shows the plot of the residuals against the fitted values, which reveals that the residuals are almost the zero mean. Moreover, the graph shows that distribution of the residuals is reasonably evenly spread.

Thus, it means that there is no heteroscedasticity in the estimation of the (4) equation using GEE 2017 data. Therefore, we move one step closer to BLUE estimation.

Figure 10. The residuals against the fitted values

Source: Author’s estimation adopted from Stata software
5.3.2. **Multicollinearity**

Then, I check multicollinearity in my regression using the variance inflation index (VIF) that measures the impact of collinearity between the variables in a regression model (Wooldridge, 2009). The standard rule is that if VIF > 10, then there is a problem of multicollinearity. The results of all the independent variables have VIF that are less than 10. The variable that has the highest VIF is “student-teacher ratio” with the value of 3.38 (see Table 20). It means that there is no multicollinearity problem in the estimation of the (4) equation. Therefore, we could accept that the estimation of the (4) equation is BLUE. Thus, results of the estimation would be reliable.

<table>
<thead>
<tr>
<th>Table 20. Variance inflation index of variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>School size (SS)</td>
</tr>
<tr>
<td>Class size (CS)</td>
</tr>
<tr>
<td>Student-teacher ratio (TR)</td>
</tr>
<tr>
<td>Teacher qualification (TQ)</td>
</tr>
<tr>
<td>Library (LB)</td>
</tr>
<tr>
<td>Sport hall (SH)</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s estimation

5.3.3. **Results**

As can be seen in Table 21, all variables are statistically significant, except “Sport hall”, and determinant coefficient or R-square is 0.52. Therefore, the result of the estimation is acceptable.

In short, the higher teacher qualification and having the library affect school performance positively. On the other hand, school size, class size and student-teacher ratio have a negative effect on school performance. Besides, sport hall is not statistically significant (see Table 21). Therefore, it influences school performance neither positively nor negatively. Results will be discussed in details after hypotheses verification.
Table 21. Multiple regression analysis result

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>35.97***</td>
<td>16.967</td>
</tr>
<tr>
<td>School size</td>
<td>-0.011**</td>
<td>0.005</td>
</tr>
<tr>
<td>Class size</td>
<td>-0.062**</td>
<td>-0.029</td>
</tr>
<tr>
<td>Student-teacher ratio</td>
<td>-0.126**</td>
<td>-0.054</td>
</tr>
<tr>
<td>Teacher qualification</td>
<td>17.68***</td>
<td>3.53</td>
</tr>
<tr>
<td>Library</td>
<td>15.32*</td>
<td>7.75</td>
</tr>
<tr>
<td>Sport hall</td>
<td>7.04</td>
<td>4.02</td>
</tr>
</tbody>
</table>

R-square = 0.52

* statistically significant at 90 percent confidence level
** statistically significant at 95 percent confidence level
*** statistically significant at 99 percent confidence level

Source: Adopted from author’s estimation

Referring to the second research question, we have six hypotheses. Based on the estimation result, the following table shows the hypotheses and empirical results.

Table 22. Hypotheses and empirical results of the second research question

<table>
<thead>
<tr>
<th>School feature</th>
<th>Hypothesis (effect on school performance)</th>
<th>Empirical result</th>
</tr>
</thead>
<tbody>
<tr>
<td>School size (SS)</td>
<td>Positively</td>
<td>Negatively</td>
</tr>
<tr>
<td>Class size (CS)</td>
<td>Negatively</td>
<td>Negatively</td>
</tr>
<tr>
<td>Student-teacher ratio (TR)</td>
<td>Negatively</td>
<td>Negatively</td>
</tr>
<tr>
<td>Teacher qualification (TQ)</td>
<td>Positively</td>
<td>Positively</td>
</tr>
<tr>
<td>Library (LB)</td>
<td>Positively</td>
<td>Positively</td>
</tr>
<tr>
<td>Sports hall (SH)</td>
<td>Positively</td>
<td>Neither positively nor negatively</td>
</tr>
</tbody>
</table>

Source: Adopted from author’s estimation

Based on the results of Table 22, we would accept four hypotheses including TR, TQ and LB affect school performance positively, and CS affect negatively. Then, we wouldn’t accept remaining two hypotheses.

Moreover, the estimation results are explained in the following paragraph.
School size

School size affects school performance negatively. It means that the bigger the schools (measured by the number of student study), the lower the student performance. Although, also, it could indicate that the smaller schools could be more effective than the bigger ones in Mongolia. Although the bigger schools have the advantage of the economies of scale, the performance of the bigger public schools is lower than the smaller public schools. Therefore, it would imply that the bigger public schools do not utilise their economies of scale advantage. In Mongolia, a couple of complex schools which combine three to four public schools exist. According to the estimation result, those complex schools would be less effective than smaller public and private schools. Therefore, the government would consider if creating the complex public schools is the right decision or not.

Class size

The class size (measured by the number of students in the class) has an inversely proportional effect on student performance. It expresses that as the number of students in one class grows, the student performance would be lower than when the class had few students. Thus, it shows that the smaller classes could be more effective than the larger ones. Therefore, if we decrease the number of students in one class, we would improve the student performances.

Student-teacher ratio

The high student-teacher ratio has a negative impact on student performance. Simply, it means that the combination of more students and few teachers make the student performance lower. Furthermore, it suggests that if we increase the number of teachers in the education sector, we could improve student achievements. The estimation result would imply that we should divide classes into smaller ones while we should hire more teachers in order to improve student achievements and as well school performance.

Teacher qualification

The estimation result implies that higher number of qualified teachers affect school performance positively. Then, the result expresses that qualified and experienced teachers
have a positive effect on pupils. Therefore, it would imply that supporting and encouraging teachers to study more and pursue the further degree and certificates beyond the bachelor degree has a positive impact on student performance.

Library and Sport hall

The library and sport hall are used as the proxy for school resources in this study. According to the estimation result, schools have at least one library performs better than those haven’t any library. Thus, it reveals that the library has a positive impact on student performance and as well school performance because the library gives an opportunity to students to study more.

According to the estimation result, the effect of sport hall on student performance is not statistically significant. Therefore, sport hall affects school performance neither positively nor negatively. Based on the estimation result, this study doesn’t support any link between school performance and having a sport hall.
6. CONCLUSION

This thesis seeks to answer two research questions regarding the performance of public and private schools, and the effects of school factors on school performance. The thesis employs data from the MEM and NSOM and applies several quantitative analysis techniques.

The first research question is that if private secondary schools outperform public secondary schools. The study utilises the different comparisons based on the GEE 2017 result to answer the first research question.

Based on the comparisons, private schools outperform public schools by some distance. Moreover, private schools still perform better than the set of chosen public schools which locate in the apartment micro-districts and have good academic records.

Although private schools outperform public schools, some public schools show excellent performance. For example, School 11 leads all schools by GEE Math result. Also, Cambridge standard flagship public schools perform excellently and could achieve the same as private schools, which have high tuition fees, do in GEE.

As most of developing countries' cases, private schools perform better than public ones in Mongolia. But, that huge difference may reveal that students don't have an equal chance to get a decent education. Furthermore, it would have the negative consequences in the long term, such as less equity, less social coherence, and less social mobility.

The second research question is that how school factors affect school performance. This thesis applies education production function and multiple regression models to answer the second research question.

According to estimation results, teacher qualification and having the library affect school performance positively. In contrast, large school size, class size and high student-teacher ratio have a negative effect on school performance. Besides, having sport hall does not affect student performance either positively or negatively.

The negative effect of school size explains that the bigger schools perform lower than the smaller schools. Also, it could suggest that complex school would not be a good idea.
Moreover, the negative impact of class size reveals that the smaller classes are more effective than the bigger ones. Higher student-teacher ratio affects student achievement negatively. Thus, it would imply that hiring more teachers and increasing the number of teachers would have a positive impact on student performance.

On the other hand, a positive effect of teacher qualification reveals that the more qualified teachers, the better students perform. Also, a positive impact of the library would imply that it gives more convenient studying environment to students.

6.1. Recommendations

Based on empirical results, this study suggests following recommendations.

The government should try to open more flagship public schools or transform traditional schools into flagship model because first three Cambridge standard schools perform excellently and compete with the leading private schools. Thus, creating more flagship school would increase public school quality and improve student performance.

The performance of the bigger public schools is lower than the smaller public schools. Thus, it would reveal that complex school might not be a good idea. Therefore, dividing those complex schools into individual public school would be a good idea. The government should consider splitting complex schools.

Since the smaller classes are more effective than the bigger classes, the government should expand school buildings and build more schools to decrease class size (measured by the number of student study in one class). Also, the government should invest in to build the libraries within schools because the library has a positive impact on student performance.

Investing in teachers’ education would be an effective way to improve the whole public education sector, and it would have a positive effect on student achievement too. Developing teacher training centres, enhancing its curriculum, and motivating teachers’ continuous learning could be the influential approach to nurture teachers’ quality and skills.
In order to measure student performance more precisely and compare them with other countries, education sector should introduce well known international standardised tests, such the Programme for International Student Assessment (PISA) test.
7. REFERENCES


OECD. (2012). *Public and Private Schools How management and funding relate to their socio-economic profile*. OECD.


